peacetime procurement of real estate. There were no people trained to do that, so we took any people then we could find and made them real estate experts overnight. Obviously, they weren't.

Q: What would you say about the quality of the engineer troops that were in Vietnam?

A: My view is that the early troops were fine. As I have indicated, every unit was turned over in its entirety by a yearly rotation. This very much decreased their usefulness during that rotation period. Gradually, of course, this effectiveness increased. As far as I am concerned, the training of the individual soldier or the individual officer was all right. However, essentially all of our replacements came in at the lowest level, both officers and enlisted men. That was the replacement system.

Q: Did you have much contact with Major General [Robert R.] Ploger when he was in Vietnam?

A: Yes. Ploger was the USARV [U.S. Army Vietnam] engineer, just as the Navy and Air Force each had an engineer. I had a good deal of contact with him in relation to the Army's requirements and capabilities. For instance, I got from him the Army's construction requirements and issued to the Army-in effect, to him-the construction directives that allowed them to expend funds for the approved projects from their list of need. At the same time, we allocated the construction effort, whether it be an Army troop effort or whether it was to be done by the civilian contractor. This required continued liaison.

His responsibility was to determine Army requirements, and mine was both to approve those and to fit them into the overall program. Once assigned the mission and the authority to build, where Army troops were involved, he furnished the resources to do the actual construction.

Q: Did you have much basis for assessing the allied engineer troops that were in Vietnam?

A: The only allied troops were the Vietnamese and the Koreans. I was responsible for advising the Vietnamese engineer element. As a result, I kept in fairly close contact with what they were doing. I had been familiar, from my Korean assignment, with the Korean engineers and their capabilities. Essentially, they satisfactorily executed those things which were assigned to them. The major facilities were provided by using either the contractor or U.S. units. Essentially, the allied troops took care of themselves as far as housing.

Q: You left Vietnam in the fall of 1967. Can you recapture what you thought about how the war was going and American prospects at that time, forgetting what actually did happen?

A: First, I have to say that I was distressed when the decision was made to move American troops into Vietnam in 1965. While I was aware of the Gulf of Tonkin resolution because I read intelligence and back channel messages in Korea relating to what was going on in Vietnam, I was distressed that we were taking on this mission. I had been somewhat familiar with previous studies, including the report of the team that President Eisenhower sent to Vietnam to assess what we could or should do to help the French. The advice as a result of that mission was, in effect, "Stay out of Vietnam!" I felt very strongly that that was still the right advice.

So, my first reaction was distress that we were going ahead and taking an active part. after I'd been in Vietnam for a few months, I came back to Washington-in late May or early June of 1966—to report to the Department of Defense on construction activities and to continue some of our planning forfuture requirements. While there-I was only in the States about ten days- 1 began to realize that the public perception of the war was changing.

When I got back to Vietnam, General Westmoreland asked me what was going on in the States; what was my perception? My response to him was that I thought things would be all right if the people would just stay behind us, but I saw evidence that questions were beginning to be asked and the support for the war wasn't (comparable to) that existing in previous wars. All that to say that my first feeling was that we should never have been there; second, there was not universal support for the effort. This was reinforced by the presidential decision that we weren't going to change the national economy and go on a wartime footing, but would have the "guns and butter" approach. I felt it impossible to do both.

With this background-let's get back to how I felt in late September **1967.** We were reaching the level of effort that had been approved. It was very clear from the way things were going that additional effort was needed. And I questioned whether it was going to be furnished.

There had been limits set on the war and how it would be fought. The restrictions such as a ban on invasion of North Vietnam and constrained activity for use of air attacks again set limits such as we had seen in Korea. My view was influenced by the fact that I had become convinced that we had made the political decision, possibly without fully realizing it, that we weren't really going to fight the war to win it. In effect, a theory of gradualism, as in Korea, had developed, which, in my opinion, foredoomed our efforts.

I thought the difference depended on whether or not the Vietnamese themselves could ever reach the point where they could take over. The major effort of the U.S. forces in the approach to the Vietnamese, both militarily and politically, was to try to increase their input into the war. I felt at this point that what would actually happen was going to depend largely on whether we were successful in changing the hearts and minds of the Vietnamese people to make them take on, in full measure, their own responsibilities.

Looking back on it, I was not overly surprised at what happened in the early 1970s, although I would not have foretold the disaster that actually occurred. I would summarize by saying it was the wrong war at the wrong place. And we did a very poor job, as a nation, of making up our minds, once we got in it, to do what was necessary to win it. Consequently, the results were not too unexpected. That is not a criticism of individuals, particularly those in Vietnam. It's a question of the national will.

We expended'a great effort and lost many lives and resources for a very, very limited result. I did anticipate that our construction of ports, roads, and airfields would represent a material asset to the Vietnamese after we were gone. Obviously, I didn't mean the North Vietnamese!

Q: But it nevertheless has been an asset.

A: Probably.

Q: Can you think of any other aspects of the whole Vietnam situation that you'd like to touch on?

A: Well, I think, essentially, we weren't prepared for what we took on. We decided to send troops before we were prepared to receive them. And we were very, very hesitant to discard peacetime methods and to get on with decisive actions. I think this was the big deficiency of the Vietnam experience. There was a feeling when we became involved that all we had to do was growl. Obviously, this just didn't work.

Q: Are there any individuals who haven't been mentioned who were outstanding contributors?

A: I think everybody who was there did everything they could to make the best of a bad situation. I don't have any criticism of or desire to single out any individual. A lot of good people did a lot of good work, but the short tours and constant change of personnel were very adverse factors. Yet, from my experience in World War II, I have to say that I think the one-year rotation was a proper policy, particularly in the environment of Vietnam and in view of the fact that a relatively few were carrying the whole load. I think it would have been wrong to have kept people longer. So far as I

know, only general officers stayed longer than a year. This provided some continuity. Nevertheless, yearly rotation had a distinct adverse effect on the war.

Military Construction, Office of the Chief of Engineers, 1967-1969

Q: I bet you were happy to be going back to Washington.

A: Yes, I was happy to be getting back to my family, and I was not averse to going to Washington. The change, however, came as a surprise. I had talked to General Westmoreland a few weeks before-approximately six, I guess-about how long he wanted me to stay in Vietnam, and he had asked that I plan to stay at least until sometime in 1968. This was what I anticipated; finishing at least two years in Vietnam. The request for my reassignment to OCE as director of military construction caught me a little bit by surprise, but General Westmoreland allowed me to leave.

Q: Again, do you have any insight into the background of this assignment?

A: I don't know what really took place. Of course, other requirements were coming up, and I replaced General [Andrew P.] Rollins, Jr., who then went to Vietnam as director of construction to replace General Raymond, I believe. I assume that the job at OCE was open, and General Cassidy felt that it was time I was coming home and that this was a good assignment for me.

Q: So that for a period of roughly 21 months you'll be director of military construction in OCE, then become deputy chief and then go to the Defense Nuclear Agency. The rest of your Army career will be spent in Washington, although you don't know that at the time. In the Directorate of Military Construction from 1967 to 1969, with what major areas were you involved?

A: Of course, the first thing was catching up on where we were. Shortly after I got to OCE, I made a trip to the Middle East to review the work being done by the Mediterranean Division in Ethiopia, Saudi Arabia, Iran, Turkey, and Italy. Out of that came a question that General Clarke and I discussed at some length related to our continued activities in Saudi Arabia and just how heavily we should be involved. We were at that time building communication facilities, TV facilities, and later some military cantonments.

I think the major activity was attempting to keep the Army requirements for military construction, other than in Vietnam, moving forward. The continuing support of Saudi Arabia was somewhat of a drain on our personnel resources, although not on funding,

since the Saudis provided the total funding. Later on, toward the end of this period, the Post Office [now the U.S. Postal Service] construction task was assigned.

One of the early actions was the establishment of the Construction Engineering Research Laboratory [CERL] in Champaign, Illinois. This idea had been fairly well developed but hadn't been finalized. Working out the final leasing arrangements for its support with the University of Illinois was required. There were also discussions as to possible reorganization and realignment of activities, but these were continuing questions requiring consideration and recommendations. In retrospect, I would say that the period was one (other than the support of Vietnam and the Saudi commitment) of routine actions without many new or major changes. I did become convinced that our small-sized nuclear power program was not going anywhere, and I worked to close it out. The small reactor nuclear power program really had no mission after the completion of the *Sturgis* as a floating power barge.

Q: At Fort Belvoir?

A: The final results were handled at Fort Belvoir, but the program had been ongoing since the middle 1950s. In Vietnam we had raised the question of using the nuclear power barge to meet a part of our electrical requirements. The U.S. ambassador, for political reasons, vetoed bringing any atomic power into Vietnam. Based on this experience, use of the *Sturgis* was to be a continuing problem.

Q: That was the basic reason?

A: That was one of the considerations. That, plus the fact that with all of the restraints, restrictions, and safety precautions related to nuclear power, there is no place on earth where you could not run an equivalent oil-fueled power plant more cheaply than you could a small nuclear plant. Therefore, the whole basis on which the program had started, as far as I could determine, had changed. And the current situation no longer justified the level of effort it required.

Q: Were you indicating, when you were talking about the Saudi commitment at the beginning, that this perhaps was a drain?

A: It was a drain on the Corps' resources at a time when we were restricted in availability of qualified people. While they were paying the dollar cost, we were still providing the trained people. The question was how long it could, or should go on. Later, while I was deputy chief General Clarke and I protested to the State Department that this wasn't really an appropriate mission for the Corps. They insisted that, as a matter of diplomatic relations, as long as the Saudis were, [the State Department was] strongly in favor of

our continuing the operation. This led to the much heavier commitment we have today compared to that of the 1960s or early 1970s.

Q: The basic problem, then, was personnel?

A: You could see it continuing as responsibility to a foreign country, and we questioned whether this was the right thing to do.

Q: Did you feel that way about any of the other assistance programs that were going on then?

A: I think this case was different since it was more a matter of supporting a civilian economy rather than military support.

Q: Have you thought of any other programs in the same light?

A: I felt differently about the Post Office program that came later during my tour as deputy chief because this was a special need in our own country. In Saudi Arabia we were making what appeared to be a relatively long-range commitment to a foreign government, which is not a normal activity. Yes, if it was an emergency, but not on a continuing basis. That was what we were thinking about. The State Department, on the other hand-and I think appropriately-recognized the long-range implications in the Middle East. They felt that, if this was a service we could provide to the Saudis, it was important in the national interest. Therefore, our parochial interests concerning shortage of personnel and commitment of trained people and things of this sort were secondary to the overall considerations. That was the final decision, and that's the decision to which we adjusted. As I said, over the years our commitment has grown larger rather than decreased.

Q: What was General Cassidy like as Chief of Engineers?

A: What do you mean?

Q: How would you compare him in approach or method with the others with whom you worked so closely, such as Sturgis and Itschner?

A: Well, Sturgis, Itschner, Wilson, and Cassidy were all different in their approaches. I would say that Cassidy was more like Sturgis in terms of ability to delegate and let others take care of the details while reserving himself for the long-range picture. I didn't have any real problems in dealing with any of them. I recognized the individual characteristics, traits, and methods of operation. I had no major problems in adjusting

to what they desired. I don't remember any significant situation that should be mentioned.

Q: I suppose you would include Clarke in that group also?

A: Yes.

Q: Did you feel closer personally to Clarke than to the others?

A: Yes, basically, because we were about the same age and had similar experiences. Also, we had worked very closely together over the years. However, I had also worked very closely with Cassidy. For instance, he was in Japan when I was in the engineer section of the Far East Command. For a while, he was exec of the engineer section. As a result, I had known him quite well. But, Clarke and I were, as I said, much closer to the same age and length of service so that it was a different arrangement and situation.

Q: Now when you became deputy chief in 1969, was it more or less concurrent with Clarke's becoming chief?

A: The same day.

Q: You now continue (correct me if I'm wrong) with responsibility for military matters and also civil works.

A: Well, for whatever the deputy was assigned. With a single deputy, responsibilities really are across the board.

Q: Were you satisfied with your duties?

A: Yes. I would follow more closely the day-to-day activities, leaving the chief free to deal with the long-range aspects and the Corps' responsibilities such as meetings with higher levels of the Army, the Department of Defense, the Congress, and such.

Q: Was that the first time the chiefs office was that way-that is, in 1969?

A: I don't remember when it became a one-deputy system-sometime between Itschner and Cassidy, probably under Wilson.

Q: Yes, I think it was under Wilson.

A: Clarke indicated that he wanted me to handle essentially the operation of OCE and the general day-to-day activities.

Q: Who was his executive then, do you recall?

A: [Richard F.] McAdoo. I can't remember who took over for me in military construction, but it was probably Dan Raymond.

Q: I don't have that. Now Koisch, who had worked for you in Fort Worth, came in as director of civil works at that time?

A: Yes.

Q: Did Clarke have any-probably not, since you both came in at the same time-say about who was to become deputy?

A: Oh, I think he had everything to say about it.

Q: And he chose you?

A: Yes, I assume so. It wasn't too illogical. I believe I was the senior officer, next to him, assigned to OCE. Anyway, it was totally his decision.

Q: Now environmental questions became quite major at this time and involved the Corps, particularly with new legislative requirements. I wonder if you can discuss the Corps' response to the environmental movement?

A: Yes. One of the things that General Clarke established was an advisory committee of environmentalists.

Q: The Environmental Advisory Board [EAB]?

A: Yes, this was his idea. I must admit I had some reservations about it. I still have mixed emotions about it. But, in the climate of the times, it was undoubtedly a good approach to take.

Q: Could you explain some of those reservations that you had then and still have?

A: My feeling was that if you appointed strong environmentalists, they would want to have an active part. They would not be willing to simply give advice and not see it followed. They would soon lose interest unless we took their advice, and I did not see how we could bring in an outside group like that and have them set policy for the Corps. I think we were fortunate in having most of the people who served-not in all cases-but some of them were broad enough people so that they recognized the inherent problems.

Q: Who, for example?

A: I don't remember names, but the people who were in the first groupwere, except for one individual, [open minded] enough to recognize that we truly wanted to have the benefit of their knowledge and experience. But they also understood that we were not always totally free to do whatever they suggested. I remember several discussions concerning the Cross-Florida Barge Canal and other projects that were then under way. Their view was that we simply ought to stop them.

It took us a little while to convince them that Congress and the executive branch were deeply involved in these decisions—not just the Corps of Engineers. Our job was to carry out the mandate given us. There were some frustrations in this relationship, and I was a little concerned as to whether we could ever have effective dialogue. We weren't going to be free to take the drastic actions that they were interested in having us take. It is a reflection on the very capable way in which General Clarke handled the group and the people who made up the group that some of my fears of a total adversarial relationship didn't materialize even though the potential was there.

If you didn't have these types of individuals-shall we say "well-labeled" environmentalists-then you didn't have credibility in the community because the feeling would be that you had "homogenized" environmentalists. We had a fine line to walk in finding people who were credible in the environmental movement and yet who were willing to work with "the enemy."

I remember speaking at the annual meeting of the Audubon Society in Seattle. One of the senior officials of the society was on the Environmental Advisory Board. While we didn't all reach agreement, I had a very interesting time on a panel talking to about 500 members. I remember pointing out to them that, while they had a right to their opinions and to expressing them, they had to realize that they didn't speak for everyone and their views were not shared by everyone. There was more than one side.

The "typical little old lady" got up and said, "Well, if they were here, we'd speak for everybody." I never did find out just what she meant by that. I think she meant, "We speak for everybody here."

The point is that they still were a reasonably small crowd. Another point made was that we were meeting in an air-conditioned facility in Seattle that didn't even have any windows. Obviously, air changes were totally controlled by electrical means. At the same time, they were carrying on a big discussion about how the major dams on the Columbia River were an environmental disaster. I asked them where they thought the electricity came from to make this auditorium usable. They didn't have any good

answers. My whole point was just to try to get this group to look beyond the immediately obvious.

It is easy to list things that we should do, but most take for granted some of the benefits that come from things to which they object. It was a good exchange. Essentially, in my trips, I tried to represent General Clarke's position and my own as chairman of the rivers and harbors board, one of my ancillary duties. I had a very interesting two years in the assignment.

Q: Do you recall much about General Cassidy's position on environmental matters?

A: The pressures were not the same. I don't think any of us wanted to despoil the environment. On the other hand, most of us who came up through that period were committed to the fact that, if something was economically justified under the terms controlling at that time and Congress authorized the project, it represented an economic gain and was therefore a viable and desirable thing to do. The environmental movement simply added a dimension and additional specific criteria that we had to take into account. It soon became a major factor in project planning.

Then came the requirement for the so-called environmental impact statement. Nobody knew what it was, and the courts began to make determinations. The whole thing seemed to consist of determining how many feet of books you could include in a study to come up with an environmental impact statement. The main effect was to greatly increase the time it took to plan a project and to greatly increase litigation.

Q: Do you recall political pressures being particularly strong on the Corps to become more responsive environmentally, such as, perhaps, from Congressman [Henry] Reuss of Wisconsin?

A: I don't remember having any personal contact with Reuss. Certainly, there were vocal elements. In the early stages of the Council on Environmental Quality, I remember several meetings with them when [Russell] Train was chairman-discussions about the Cross-Florida Barge Canal and other projects. This was more in terms of discussion. Senator [Edmund] Muskie is the only one I remember particularly, because I participated in several hearings before his committee.

Q: Did you feel that he had much of an understanding of the Corps? Was he taking an adversarial position?

A: No. Actually, in the dealings that I had, he was trying to use the Corps, which he characterized as being responsive to environmental concerns, as a "club" against the AEC [Atomic Energy Commission], whom he couldn't get to take the same attitude.

Q: Do you recall much about the emergence of the Institute for Water Resources [IWR]?

A: Yes, in general, although actually I had very little to do with that directly. The idea had been developed and was handled primarily between Koisch and General Clarke. The development of the institute and the combination of various activities affected were just starting. As initially envisioned, it was designed more or less as a long-range planning group.

Q: Did the institute, to your knowledge, get involved much in policy writing?

A: I don't know.

Q: What about the Engineer Study Group? Are you familiar with that?

A: It had already been established. It was active and was used in many of the long-range studies carried out as a part of our military planning. At the same time, it operated primarily under the military operations group led by General Ploger.

Q: In his interview, General Wilson stressed what an important capability it was for the Corps to have this type of group.

A: It was well received throughout the Army. It had very close contacts with the Army staff and was a visible and viable source of Corps' input to many studies carried on by the Army staff.

Q: Did you have much dealing with Joe Tofani?

A: Yes, particularly through the rivers and harbors board activity. As chairman of the rivers and harbors board, I reviewed all of the various proposed water resource projects. He was responsible for staff supervision of the planning function throughout the Corps.

Q: You mentioned the Cross-Florida Barge Canal a couple of times earlier. Would you have any comments on the problems that you were having with that project?

A: I think it was a desirable project. I don't share the feeling of disaster that was presented. I made a trip to the area. I looked closely at this "nature in the raw" that they called the Oklawaha River, which was essentially the source of water and the general trace of the canal. As far as I'm concerned, you couldn't do anything to make it worse, so I was personally disappointed that the project was canceled. However, I understand the political realities. It would have been a distinct asset to our inland waterway system. There's no question about it in my mind.

Q: How do you feel about the Tennessee-Tombigbee which is more of an issue lately?

A: I think it's of questionable value because we already have a water route, and the project's advantages are only those of shortening the route. In this day and time, costs are so outrageous that it does raise the question of the proper allocation of funding. On the other hand, because it's been started, I feel very strongly that it ought to be finished. I see nothing to be gained by stopping it. I think it was a viable project, but I think it was also a question of priorities in the current economic situation considering the cost increases that have come about. Certainly it is subject to legitimate question.

Q: I wonder if you have any other comments about your experience in OCE, since your next assignment will take you out of OCE and will also be your last active-duty assignment.

A: I alluded before to the fact that I went with General Clarke to his first meeting with Mr. Winston] Blount, then the Postmaster General, when he began to talk about the Corps' supervising the great expansion of the facilities of the Post Office Department.

Q: General Wilson claims some involvement in that too, as a retired officer who was a friend of Blount's.

A: Yes, he knew Blount, and I expect that he may have guided Blount along that way. In our first conversations with him, we were receptive to the suggestion. As a result, I supervised the preparation of a booklet, which I'm sure you can find somewhere in OCE, on the possibilities of the Corps' taking on the responsibilities for managing construction of the Post Office Department. As I remember, it was about six months from the first contact until the next event occurred. We finally entered into an agreement to handle the function. Everybody was agreeable at the time, but then somewhere along the line the Office of Management and Budget got into the act. They were the ones who finally killed it. I think we had a service to give just as we had for NASA. Since I had been intimately involved in the NASA activities, I was in a position to speak from experience after doing work for another government agency. I felt that a satisfactory system could be established. As far as I know, it was a satisfactory arrangement during the few years it lasted.

Q: Was it a matter of budgetary considerations that kept-

A: I think the OMB, politically, didn't like the idea that the Corps of Engineers was expanding its sphere of activity. That's my impression based on what I've heard. I can find no logical reason for their position other than political [considerations]. The cancellation came after I left OCE.

Q: Is there anything else to recall from that period?

A: One interesting sidelight. When the fire in January 1967 killed three astronauts at Cape Canaveral, the NASA administrator came to General Cassidy for help because of our close association with NASA through the construction of its facilities. As a result of the congressional review of that disaster, in the 1968 NASA appropriation Congress directed the administrator of NASA to establish a safety advisory panel. This would be a group of outside experts who would analyze NASA's handling of risk and the risk assessment function and make an independent report to the administrator.

When he had to appoint this board, Mr. James E. Webb was somewhat at a loss to find people with experience in dealing with major projects who weren't already a part of the NASA program, either as NASA employees or as contractors with major contracts-and therefore with possible conflicts of interest. All of the aerospace companies were involved in the space program, In looking around, Webb asked General Cassidy, as Chief of Engineers, if he would suggest someone to be a member of the panel.

James Fletcher presents a NASA flag carried on the first Skylab mission, May-June 1973 to Lt. Gen. Carroll Dunn at his retirement as chairman of the Aerospace Safety Advisory Panel.

Because of my past experience in military construction and my past experience with NASA, General Cassidy suggested me, and I was appointed to the panel. This occurred in the spring of 1968. I continued to serve on that panel until September 1973, even after I left OCE. In fact, I was chairman of the panel for the last two-plus years. Again, this was an outgrowth of the Corps' association with NASA. The association became a personal commitment as far as I was concerned. Toward the end of my service, this began to take something like 10 to 15 percent of my time, a major commitment, as the space program got very active in the last days of the moon landing and then later with sky lab.

Another of my functions during the time I was deputy resulted from my service in Vietnam. I coordinated the support activity of OCE and the Corps for the Vietnam effort. I kept fairly close contact with events over there and the requirements that were being placed on the Corps.

Q: Did you get back there again?

A: I was back one time because I served on a board to investigate some alleged misuse of construction funds in Thailand. And while I was in Thailand, I made a side trip back to Vietnam. This, if I remember correctly, was in late 1968. That was the only time I was back in Vietnam.

Q: Do you recall any of these individuals? Mark Gurnee?

A: Yes, Gurnee was in civil works, the director of operations for civil works. I'd known him for a long time.

Q: Was he there when you came? I mean, had you known him earlier?

A: I knew him when I was at the Waterways Experiment Station. We had considerable contact with his group on the plant account activities. He was also in OCE at the time I served as executive and as deputy.

Q: How about Barney Dodge from the Institute of Water Resources, or David Agerholme?

A: I had no direct contact that I remember.

Q: Your last active duty assignment was with the Defense Nuclear Agency as director. At that point you were promoted to lieutenant general. Was that-maybe not that specific assignment but that type of assignment -what you expected at this point in your career? Did you expect to stay longer in OCE as deputy?

A: It is pretty hard to say what my expectations were. I had served as deputy for about two years. I anticipated that General Clarke would serve out a four-year term, and I could well have served a similar four-year term. General Westmoreland was the Chief of Staff of the Army at the time. Since I had worked very closely with him in Vietnam, he was personally aware of my attributes and capabilities. It was my impression that General Clarke also had recommended to the chief of staff that an appropriate assignment be found for me that would provide for a promotion. General Clarke appeared to feel that was appropriate. He did not say much to me other than telling me that he had recommended me for promotion. What went on that resulted in my assignment to DNA, I don't really know.

I met General Westmoreland in the hall of the Pentagon one day, and he said, "I've been looking for you." Then he said, "just nominated you for a promotion to lieutenant general and to be the head of DASA." I said, "What's DASA?" (It was called Defense Atomic Support Agency at that time.) He caught me so by surprise that I really didn't

correlate the two names. That was how I found out about the assignment and promotion. What went on in the background, I'm not sure. It was not too unusual for an engineer to have that assignment since General [Leslie] Groves had been the first director of the Armed Forces Special Weapons Project, later called DASA. Then shortly after I got there, it became the Defense Nuclear Agency.

It was a challenge and an opportunity and, while I hated to leave the Corps, I realized that my period of service was getting short. Incidentally, just before this time, late July 1971, I believe, I had had an offer from Con Edison to retire and go to work there. I had turned it down. When the assignment to DNA came, I remember thinking that I had made the right decision staying in the Army, and I appreciated the opportunity both for the promotion and to take on an organization of my own. All in all, it was a welcome assignment.

Defense Nuclear Agency, 1971–1973

Q: What was the agency's mission?

A: It has basically three missions. One, and probably the primary mission, is testing of nuclear weapons effects on people and equipment. It has a radiobiological laboratory as a subordinate organization, located at Bethesda [Maryland], which carries out nuclear effects tests on animals and sponsors other studies of nuclear effects. It also does a lot of detailed research in all phases of the effects of a nuclear explosion, whether it be on equipment or on people. DNA is responsible for setting up and carrying out tests to determine the effects of nuclear radiation on new weapons; for instance, determining how a new warhead is affected by radiation from a nearby nuclear explosion. The underground testing at the Nevada test site is a major activity. DNA has a field organization at Albuquerque, New Mexico, that carries out these tests. DNA is also responsible for maintaining a capability to reinitiate atmospheric testing of nuclear weapons using the facilities at Johnson Island in the Pacific. So weapons effects testing is one of its major activities.

The second mission is, in effect, to keep an accounting of all atomic weapons regardless of which service stores them. No weapon can be moved without orders from the Defense Nuclear Agency. This provides a centralized accountability for all nuclear weapons. It also involves inspecting for security and storage on a worldwide basis.

The third mission is the interface with what was then the AEC, now the NRC [Nuclear Regulatory Commission], as to the annual requirements for nuclear weapons for the services. This is done in coordination with the Joint Chiefs of Staff and the Assistant to the Secretary of Defense for Atomic Energy. They are the action agencies.

Those were the three major activities, including, of course, dealing with all the services on nuclear weapons requirements and availability. The biggest engineering mission involves the physical problem of preparing for the underground tests. Some pretty massive tunnels have been built to ensure against atmospheric release of radiation from the tests.

Q: Would that have involved much work with the Corps?

A: A limited amount of work with the Corps. This work was contracted using primarily the contractors used by the AEC at the Nevada test site. We entered into our own contracts as well.

Q: Did you use anybody that you had worked with earlier-get them transferred to DNA?

A: No, I'm not inclined to carry a lot of people around. On occasion I have, but for the most part, unless it was an emergency, I would tend to let the system work and go with that.

Q: Did you find that happening to you?

A: So far as I know, every assignmentthat I held after June of 1942, when I was assigned as executive officer, 303d Engineer Battalion, 78th Division, was in response to a request. I left the 78th in November 1942 to go to the 30th Infantry Division in response to a name request. I believe every assignment that I had from there on for the rest of my career was based on a "by name request." I'm not sure if that's good. But, nevertheless, that seems to be the way it worked for me.

Q: Why might it not be good?

A: I can't say that it hurt my career, but whether it was the best thing all the way through for the Army I'm not sure.

Q: I'm wondering if you feel that you've said as much as you'd like to about your time with the Defense Nuclear Agency. Was that clearly your last assignment when you took it?

A: Well, yes. This was during the latter stages of Vietnam, and the chief of staff established a policy-I don't know when it was established-but I know it was in effect after General Westmoreland took over as chief of staff. Any appointment of an officer to a higher grade than major general, which is the highest permanent grade, carried with it an agreement that said appointment was for a specific assignment; there was no guarantee that there would be another equivalent assignment when that one was over.

Therefore, either you would voluntarily retire when the commitment was over, oyou were prepared to go back to your permanent grade if you didn't retire. I responded to the chief of staffs letter quoting this policy by saying that, when that assignment was over, if the chief of staff (or his successor as chief of staff) felt that there was no appropriate assignment, then I would voluntarily retire. That would have been in the summer of 1974. In effect, I retired about ten months earlier than would have been a normal completion of tour.

I did it because I knew that this was my last assignment. And, again, Con Edison had approached me to become their vice president of construction. They were very anxious to start a major pumped storage power plant. Since I had had some experience with hydropower plants in the Southwestern Division, they thought that experience would be useful to them. In order to meet their schedule I had to decide to retire by 30 September 1973, which I did.

Q: How did you first come to Con Ed's attention? They had been seeking you earlier.

A: Back as early as 1971 I had been approached by them. Then, in the spring of 1973, realizing that within a year I probably would retire, I began to explore some possibilities, including several in Texas. Apparently, they heard that I might be available and approached me again.

The actual contact by Con Edison was through another Corps of Engineers officer, Bill Lapsley, who had retired from the Corps as a major general. He had become involved with Con Edison, because Charles Luce, the chairman of Con Edison, had previously been the head of the Bonneville Power Administration in the North Pacific. While there, he had known Lapsley, who was at that time North Pacific division engineer. Luce later became the Deputy Secretary of the Interior in the Kennedy administration and then went from Interior to Con Edison to be the chairman and chief executive.

Shortly after Luce came to Con Edison, he found a very unfavorable situation in the company and felt strongly that it was necessary to make major changes in key positions. He began to look around for people that he knew had strong management qualifications. One of the people he recruited was Lapsley. There were also several other engineer officers who had retired and gone to work there. He had also brought in people from the Atomic Energy Commission and several other government agencies. He was looking for experienced managers who could go into relatively high positions as he reorganized and rearranged the company to suit his requirements. It basically, then, was because of Lapsley, because we had served on the rivers and harbors board together and he was aware of my activities and background. He was the principal agent in bringing me in. Lapsley later became the president of Con Edison, retiring from that position in 1975.

Military Retirement, 1973, and Retrospection

Q: When you finally retired from the military service on 1 October 1973, and reflecting from the present, how did you feel about the way your career had gone in the military? Were there any major things, or even minor things, that you had hoped to do that you had not been able to do in the way of assignments?

A: Oh obviously I would have loved to have been Chief of Engineers, but not everybody can do that.

Q: Was there a particular time when you felt that might have been a possibility?

A: There were only two times that would have been possibilities. I would have been a competitor of Clarke's and a competitor following Clarke. However, I would have been a little old at that time. So I was not surprised by what happened and had no objections, and found no fault with those chosen. Other than that, I can't really say that I have any regrets.

Q: Do you have a favorite assignment of all those that you had?

A: I expect, in the time frame in which I had it, the assignment I look back on with the greatest degree of satisfaction, all things considered, was the assignment as director of the Waterways Experiment Station. This put me in charge of a major activity at a relatively young age in an area that I knew well. It was an assignment that I thoroughly enjoyed.

Q: Would you have some general reflections about your engineering experience as a whole? You made the decision as to a career when you finished your undergraduate education, this rather than making it before you started school. Instead of going to West Point, you had gone to the University of Illinois. You had considered several offers from industry at that point-had even accepted one job-and then when there was an opportunity for a commission, because the Army was seeking engineers from civilian life, you had taken advantage of that. How did you feel about your choice?

A: I don't have any regrets. I think that in the outcome of events I've been extremely fortunate in the decision to go in the Army. One factor to remember was my feeling that something was going to happen and I would be in the Army anyway, so I might as well go in to start with. Maybe it was not quite as calculating as that might sound, but nevertheless that was part of my decision. Obviously, as events turned out, things got very active. There is certainly no question that had I not gone in the Army in 1938, instead of being a battalion commander in World War II, I would have probably been a platoon or company commander called up as a Reserve officer Certainly, my civilian

life, whatever it was, would have been disrupted. Again, there's nothing wrong with that. I'm simply saying that I had the choice of making the Army a career or making civilian life a career, with a strong possibility for the disruption of civilian life. I chose under those circumstances to make the Army a career. I'm trying to make the distinction between the fact that it wasn't that a war appeared to be coming and I wanted to be ahead of the game, but that I figured that I was going to be in the Army sooner or later anyway—so I might as well decide to start with the Army as a career instead of having it disrupt another career.

Events proved that I made the right decision. I don't believe that I would have wanted to be in the Army in any branch other than the engineers. Although I've had several important non-engineer assignments, which I enjoyed and found to be a challenge, as a whole I wanted to be closer to an engineering career. It was the opportunity for a commission in the Corps of Engineers as well as in the Army that made the choice attractive.

I have enjoyed all of my assignments and gained from them, so I don't look back on my career with any regret. I feel very fortunate that I have had many opportunities. What may have seemed to be minor events have helped shape my career. Some examples were the WES anniversary celebration, which brought me to the attention of General Sturgis, and the OCE service, which acquainted me with many key people. There's no question that that played a part in my career advancement and in the assignments I've been given. I really don't feel that I could have made a major improvement if I had been free to choose my own assignments.

Q: What about troop command?

A: Well, I had troop command my first seven years up through battalion command in wartime. Frankly, after you command a battalion in wartime, no other troop command makes any difference. That's the command! When you get above that, you don't have the same relationship. The difference comparing my case to a current career-say, the career of my son—is that I got a tremendous amount of experience in a very short time. This was because of the time frame in which I came along. He (my son) will undoubtedly learn more in longer term assignments and individual assignments, but he won't have the opportunity for the wide diversity of assignments that I had. Each of us is a product of the times in which we live, and, rather than serving in three wars, as there were in my career, I hope he has had his war experience in Vietnam with no more in the future.,

Q: He's in the engineers, is he not'?

A: Yes.

Q: Did you encourage him to go in?

A: I was surprised when he said he wanted to go to West Point, but was glad to help him get an appointment when I became convinced that he really did want to go.

Q: Was the Corps of Engineers the place that he was heading for?

A: I don't know. He made the choice.

Q: I could ask him.

A: I'm glad he made the choice, but it was totally up to him.

Q: I want to ask you, too, about some of your activities since leaving the Army. Maybe we could start by recalling something you mentioned a while ago when we weren't taping. You stressed that you learned as an engineer, in your Corps experience, how to use persuasion rather than to rely on the idea that because someone was a general officer, all they needed to be able to do was issue orders. Could you comment a little bit on that in relation to a business career?

A: There is no question that there is very little place for despotic activity in business life. There is even less in the Army, for that matter, although some people do display these characteristics, possibly not so much now as in times past. There are also despots in business, but they started out as entrepreneurs or owners of companies and continued to head their companies. But, basically in business-*in a major company-you're dealing with equals, and you are dealing with people who are not in the habit of jumping when somebody yells, "Jump!"

The Army really gives an opportunity to show what I consider to be appropriate leadership. I feel that the Army gave me experience in leadership, particularly in some of my assignments involving essentially civilian organizations. The Waterways Experiment Station and the Southwestern Division gave me this opportunity to work with people other than in a close-knit military discipline.

The combination of that experience along with Army training in leadership taught me how to get along with people and how to influence people to work cooperatively toward mutually desired results. For these reasons I feel that, contrary to some thoughts about the "military mind," the military is a very good source of training in how to deal with people. In many cases, surprisingly, I find that to be a deficiency in business life. I find too many people in top-level positions who really don't know how to get along with people and how to lead people or to work with people. They are not

at ease in such circumstances. And yet, I find some of these people in pretty high positions.

The other thing that I have found in business—and it has been somewhat of a surprise--is how much the business community could learn from the services about how to do proper staff work. I've found it very difficult to get someone not trained in staffwork to know how to assess a situation and how to put it down on paper to reach a logical conclusion as to a final decision. [People who lack a background in the staff work] just do not seem to have the training to complete the process. As a result, they are much more concerned with trying to figure out ahead of time what answer you want. Then they try to write something that justifies that answer rather than seeing the need to assess the situation-its various components and the alternatives-and then coming to a logical, well-supported solution.

In response to the question of differences between military service and civilian life, the thing I've noticed most is the lack of well-qualified people to do what I would call quality staff work to help arrive at logical decisions. I've heard other people say the same thing, but this I have noticed particularly.

Consolidated Edison Company, 19734980

Q: Your first post-Army position was with Consolidated Edison Power Company?

A: Yes, I became vice president of construction, primarily to start the pumped storage power plant at Cornwall [New York]. There was also other construction-a $600-million-a-year construction program; certainly a major program for a private company. We started Cornwall construction but were stopped by court order based on a suit by environmentalists. It is still in court, although the project has been abandoned. I think it was a very poor court decision, and New York is worse off as a result. They are going to pay more for their power needs without it. It would not have been environmentally damaging. Nevertheless, one cannot undo what has happened.

After I had been with Con Ed about ten months, I became senior vice president with responsibilities for environmental affairs, engineering, and construction. You can see that this was a very close parallel to the Corps of Engineers' responsibilities of a division engineer or deputy Chief of Engineers. This assignment was in line with plans laid out when I first talked to Luce and Lapsley. They wanted to make this combination assignment when it became appropriate.

Before I joined Con Edison, while being interviewed, I specifically asked the chairman why he was interested in a 57-year-old man in this field. His quick answer was, "For

two reasons: one, I need someone who has the expertise and the knowledge that can do the job we have now. I also need someone who can train others coming up to take over when he leaves. That is the reason I'm more interested in a 57-year-old with the experience you have than I am in a 45-year-old who may already be here but not have that experience. There is a gap that I want to fill, and you fit it." I feel that I was able to accomplish what he wanted in the seven-plus years that I worked for Con Edison.

Q: And that environmental issue with the Cornwall project was a major event during your time?

A: Oh, yes, but there were other environmental issues such as nuclear power plant completion, and after completion, its effects on the Hudson River. We made multi-million-dollar studies of biological activities in the river.

Q: How would you characterize your attitude toward the environmental movement in general?

A: Pragmatic. I believe environmental factors are important, but that we have gone totally overboard. The government has gone absolutely crazy in issuing regulations and instructions, lacking a basis for many of them. We have gotten too emotional about the environment. While I think we can make major improvements, say a 90 percent improvement in air and water quality, we're throwing billions of dollars away trying to get a few percentage points above that in both mediums.

Having experienced both cancer and bronchial asthma, I have no sympathy whatsoever with the people who say we can have wholly pristine air, and any substance that presents the slightest risk of creating cancer in animals must be abandoned. I think that is a very stupid and unrealistic approach to life. I feel very strongly about this even though, as I say, I have suffered from both cancer and bronchial problems. There are no absolutes. We add to our costs, we add to inflation, and we add to over-regulation through some of our attempts to bar chemicals and other emissions that have a tremendous benefit for improving the quality of life. We need to do some balancing between values. That, is my point of view.

I see no necessity for every body of water being fit for fishing and swimming. I just don't see any justification for it whatsoever. There are other things in life that are also important. Certainly, I also feel very strongly that every body of water should not be a cesspool either.

Q: So it's a question of—

A: Balance. In general, I agree with the current administration's approach to things. I consider myself to be an environmentally sensitive person, but not rabid on the subject.

Q: And how environmentally sensitive do you think the Corps was before the late 1960s?

A: It was never called that, but I don't think that the Corps was involved in a rape of the countryside. On the other hand, they were not particularly sensitive or overly inclined to give environmental questions too much attention. They had a job to do and they did that job with as little destruction to the other elements as possible. If you had to dump dredge spoil, you dumped dredge spoil. And it was more likely dumped where it was economically desirable to do so than where it would not affect wildlife. On the other hand, some of the best wildlife habitats grow out of dredge spoil areas. In many cases there was a balance that came about accidentally. We may not reach the same situation when we try so hard to assure it ahead of time.

The Business Roundtable, 1980

Q: Now you went from Con Edison to the Business Roundtable?

A: **Yes.**

Q: Would you like to say a little bit about your job; at least what influenced your decision to take on this project?

A: The Business Roundtable is an organization formed in 1972, made up of chief executive officers of major companies. Its purpose is based on the belief that business executives should take an increased role in those things that affect public policy and public interest-because business interests must parallel the interests of the American people. They also feel that business leaders must speak as individuals but that they also have responsibilities, collectively, to the nation.

One of the activities that the roundtable has sponsored since its founding has to do with construction problems. All major corporations are involved in some form of construction either for themselves or for others. What is now the construction committee of the roundtable has existed since before the roundtable was formed. It has been concerned primarily with productivity in the construction industry. In 1978, the committee initiated a study to determine the major problems in the industry and what could be done about them. A small group of people from the construction committee developed an outline plan for a detailed study of construction problems. They came up with about 27 specific problems divided into five major areas. These major areas were project management, construction technology, labor effectiveness, labor supply and

training, and codes and regulations. Under these general topics there were multiple problem areas.

Having developed this general scope for a detailed study, they went to the policy committee of the roundtable in November 1979 and asked for approval for a long-range study to find answers. They also asked for the roundtable's commitment for both funding and for action to back the project. They envisioned a four-phase study, the first of which was really the development of the outlined scope. The second phase was detailed research and investigation of each of the problems, together with proposed solutions. The third phase was the development of a coordinated plan for implementation of the recommendations that grew out of the second-phase study. And the fourth phase was to be an extended period of implementation of the recommendations.

They envisioned three to five years to complete the project, starting in 1978 and going on for a period of time. The second phase, the research phase, would be the major activity and would require about two years. Since the committee and the members of the task force appointed to carry out what they called the Construction Industry Cost Effectiveness Project were all people who held positions in their individual companies, they found it necessary and desirable to have a project director. They wanted someone who was experienced in and known to the industry, and who would provide essentially full-time direction and guidance to the project, coordinate the development of a series of reports, and begin a plan for implementation.

This was the background, of which I knew little until mid-January 1980. I received a call from a contractor friend of mine who was serving as an intermediary for some of the members of the construction committee task force. He approached me as to my interest in the job of project director. When I discussed it with him, which as I said was my first exposure to the subject, I told him that I was actively engaged. I intended to stay with Con Edison until my normal retirement date at age 65, in August 1981, and then planned to retire to Pinehurst, North Carolina, and continue to enjoy life. For that reason, I was not available and was not particularly interested in considering the job. However, he urged me to look into it more carefully and also urged that I talk to some of the people directly involved.

Somewhat reluctantly I did so. Later I had a meeting with three of the people involved. They were serving as a search committee looking for a project director. We talked at some length, and I learned more about the project and the challenge. I was particularly impressed by the fact that this prestigious organization had committed itself not only to making the study, but to making a detailed plan and continuing to support it until something happened. In other words, it was not going to be just a study to be put on the shelf. It was to be an active and continuous effort to implement the results of the

study. This was intriguing. Also, with 40-odd years in the construction industry, I was quite aware of some of the problems. This presented a challenge to see if I could be a part of an organization that maybe could bring about some improvement in the cost-effectiveness or improving productivity, of the industry as a whole. They were not looking at just what the individual workmen on the site could do in terms of productivity improvement but at the total picture-better management, better planning, better design, and better execution in every way.

As I thought more about it, it became more intriguing. When they came back about a month later, after they had had a number of other interviews I was informed that they would like very much for me to take the job, I placed two conditions before I would make any favorable response. The first was that they arrange with Con Edison for me to continue my association with the company until I reached the normal retirement age. (This was because of current benefits from Con Edison employment and also because it would result in material benefits after retirement.) These benefits would be lost if I left Con Edison prior to the time I reached retirement age.

The second condition that I imposed was that it not be necessary for me to conduct the activities of the project from New York. Therefore, when the time came that I severed my active association with Con Edison, I was free to leave New York even though I continued to direct the study.

They accepted both of these conditions and worked out an arrangement with Con Edison that reimbursed Con Edison for my salary and a portion of my benefits. Con Edison saw fit to continue our relationship and continued to provide certain medical insurance and other benefits as part of their contribution to the study. On the 1st of May 1980, I began full-time work on the study, having taken a leave of absence from Con Edison.

At that time, there were about 50 people involved in the project. We now have more than 250, representing over 126 different companies and organizations engaged in a very detailed look into 23 specific subjects (having been reduced from the original 27 subjects), for which we will complete individual team reports on each subject about the end of 198 1. This will be followed by a comprehensive report on the overall study. At the same time, we will proceed with planning for the implementation phase that will follow, starting approximately the 1st of July 1982. Having already spent about 15 months on the project, I will continue full-time work on it for the remainder of 1981 and at least until we finish the individual team reports.

Starting in 1982, I plan to spend something less than full time, probably down to about half time by mid-year of 1982, as we proceed with the completion of the comprehensive report and the implementation plan and begin implementation. This will follow for

several years ahead. This does give me an opportunity to move gradually into retirement activities. It feeds upon my 40-odd years of experience in the construction industry, and gives me an opportunity to meet some very dedicated people who are working in the industry. Also, it supports the very deep commitment that these people and their organizations have to this multi-year, multi-phase, multi-million-dollar project. I have high hopes that we will have a major effect in changing the industry for the benefit of the economy and everyone engaged in the industry. I truly believe that our goal of appreciably increasing the amount of construction for the dollar will be realized, and our estimate of saving about $10 billion annually in the national construction program is achievable.

The dedication of the people involved has been phenomenal. These people give from 10 to 40 percent of their time to the study. Their companies pay their expenses and their salaries and donate their time, so that the direct expense of the study essentially is limited to project direction, administration, certain meeting expenses, and some consultant services. We have used a number of universities and university people to make specific detailed analyses of individual subjects.

For the most part, each person is an expert in the field he is studying, so we are getting the broadest possible experience level. A team of five to ten people study each specific subject, and the results of that study should be the best analysis of that problem and its possible solutions that is possible in the current time frame. It is a real challenge and one that I am enjoying and looking forward to continuing over the next 18 months or so as the project is completed.

Q: What other things do you anticipate doing with the other 50 percent of your time, once you get settled in North Carolina?

A: Enjoying life by playing golf and traveling.

Q: You've picked a place for golf?

A: Yes, and for relaxing.

Q: Good.

A: Forty-three years is approaching, and it will be about 45 by the time I hang it up.

Q: Do you have any other observations you'd like to make as we end the interview? Anything you feel was omitted?

A: I can't see how we've omitted anything in the details we've covered. I must say that I'm in phase with the current administration. I'm very hopeful that some of the excesses of the past can be corrected and that the country can get back on the beam-not just in environmental affairs, but also in terms of the economy. I'm hopeful about a resurgence of-all it patriotism or whatever- some degree of disciplined approach to life and finding meaning for things that will make this country an even better place in which to live than it has been in the past.

Also, I feel that this study is coming at a very opportune time; that there is a climate that will help some of these things take place. Something that started in1978 is going to mature in a very favorable time frame in terms of acceptance. I'm sure that some of our recommendations, under other administrations and [in other periods of time] would not be as welcomed. So that is a part of my optimism, that we can actually have some effect. Thank you.

Q: Well, I'd like to thank you for a very interesting and informative interview. I certainly appreciate your time.

A: Well, this has been some experience. I don't know as I have ever sat down for this long and talked about myself

This is the end of the interview with Lieutenant General Carroll H. Dunn, U.S. Army retired. The final session was conducted on 28July 198 1 in New York City.

Epilogue

At the completion of the interviews in198 l, General Dunn was the project director of the study of problems in the construction industry and possible solutions supported by the Business Roundtable.

Following completion of the study and publication of the results, he continued as a consultant to the Construction Committee of the Business Roundtable, primarily in activities to bring about implementation of the study's recommendations within the industry. His involvement continued until November1988.

A major recommendation of the Construction Industry Cost Effectiveness Study concerned the need for continuing research and study of the construction process. As a result, the Construction Industry Institute [CII] was established in 1983 at the University of Texas at Austin. General Dunn was instrumental in its establishment and early direction of its efforts. His association with CII has continued on a limited basis to the present [1997].

The Carroll H. Dunn Award of Excellence has been established at the institute to recognize an individual who has had singular and notable responsibility for significant advancement in improving the cost-effectiveness of the construction industry. Also, CII has established in the College of Engineering at the University of Texas the Carroll H. Dunn Endowed Graduate Fellowship in Engineering.

In February 1995 General Dunn was the recipient of the Chief of Engineers Award for Outstanding Public Service.

In February 1998 General Dunn was elected to membership in the National Academy of Engineers.

Following retirement from Consolidated Edison Company and while still involved with the Construction Industry Cost Effectiveness Study, he and his wife Letha moved to Pinehurst, North Carolina, in August 1981. Since 1988 he has been active in community affairs, primarily involving the Pinehurst Members Club and the Village Chapel.

In April 1996 they moved to The Fairfax, a retirement community near Fort Belvoir, Virginia.